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A university-wide survey of caregiving students in the US: Individual differences and associations with emotional and academic adjustment

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The United States (US) does not formally count, recognize, or support students in higher education who are caregivers, unlike England and Australia. This mixed-methods study presents results from a new survey of caregiving undergraduate and graduate students at a large university in the US. Students ($N = 7592$; 62.7% White, 69.9% women) reported their caregiving responsibilities, depression, and anxiety, which were linked to administrative records of financial aid, part-time status, and academic grades (GPA). A small but noteworthy portion of students identified as caregivers (5.6%, $N = 427$), either for someone who was chronically ill or elderly (3.2%; $N = 239$) or for a minor under age 18 (2.9%; $N = 227$). Caregiving students were disproportionately women, graduate students, enrolled part-time, and receiving financial aid. Further, caregivers for the chronically ill or elderly (but not for a minor) faced heightened emotional and academic risk. Specifically, caregiving for 3–5 days per week was associated with lower GPA, and caregiving more hours per day was linked to greater anxiety and depressive symptoms. US universities should identify the needs of caregiving students and design policies to mitigate emotional and academic risk.

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Undergraduate and graduate students juggle many complex and multifaceted tasks while pursuing their degree programs. For some students, these activities include caregiving for someone who is elderly, chronically ill, or for a minor below the age of 18 years. Research inside and outside of the United States (US) identifies caregiving students as a significant yet underrecognized population (Armstrong-Carter et al., 2021; Joseph et al., 2019). As early as 2005, up to 160,000 college students and 5.5 million young people ages 18–25 identified as caregivers in the US (Levine et al., 2005). Since then, experts believe that the number of caregiving students in the US has increased and is likely to continue increasing exponentially (Olson and Siskowski, 2018), in part because of demographic aging and high pressures upon families for the provision of care (Armstrong-Carter et al., 2021). Despite this national upsurge in caregiving students, the US does not formally count, recognize, or support caregiving students, unlike other countries such as the United Kingdom and Australia (Becker, 2007). Identifying which students are most likely to be caregivers in the US and investigating how caregiving relates to students' emotional adjustment and academic performance can help to ensure that caregiving students have equal opportunities to succeed in higher education, and mitigate persistent inequalities in higher education.

This study presents results from one of the first university-wide surveys of caregiving undergraduate and graduate students in the US to date. The study tested the feasibility of identifying caregiving students on university campuses, identified common demographic characteristics of caregiving students, and examined their experiences of emotional wellbeing and academic success. Specifically, the goals were to (1) identify the prevalence of caregiving students and the intensity of their caregiving responsibilities; (2) examine whether caregiving students were more likely to come from particular demographic groups (e.g., gender, race/ethnicity, financial aid status, first-generation status); and (3) examine how caregiving while a student was associated with depression, anxiety, and academic performance.

The prevalence in increase in caregiving college students in the US

Socioecological models of development suggest that university students' academic endeavors are situated in the context of their home life and family obligations (Bronfenbrenner and Morris, 2006). Many university students are simultaneously caregivers, although they are not often identified in the US. Students may care for a relative at home who is disabled or ill, such as an aging parent, grandparent, or sibling with health challenges (Siskowski, 2006). Alternatively, students may care for a minor (i.e., child or adolescent)—this includes parenthood, paid babysitting, or looking after a younger sibling. As such, many young people have the dual role of both “student” and “caregiver,” requiring them to balance challenging responsibilities, which can sometimes conflict (Mancini et al., 2006). These dual responsibilities can limit the ways young adult caregivers make choices about their future (Hamilton and Adamson, 2013). For example, in the United Kingdom, caregiving youth adults are four times more likely to leave higher education than non-caregivers (Kettell, 2020). In the US, caregiving college students are not identified routinely through university surveys or understood as having distinctive needs (as compared to their non-caregiving peers) by student support services or academic units.

Caregiving students' daily tasks and responsibilities

Caregiving students' tasks vary significantly depending on household characteristics and the needs of the care recipient.

For instance, student caregiving for someone who is elderly or chronically ill may assist with bathing, feeding, dressing wounds, administering medication, or assisting other instrumental tasks of daily living (Kavanaugh et al., 2016). In contrast, a caregiving student for a minor below the age of 18 years (who is not chronically ill) may have a more traditional parental role, including supervising, transporting, and preparing meals, depending on the age of the child. The amount of time needed for caregiving and the flexibility of tasks can also vary considerably. A student who is the primary caregiver for a relative who lives with them might spend up to 12 or 24 h day caregiving, whereas another student may provide care only a few hours a week (Kavanaugh et al., 2016). The chronicity and intensity of caregiving depend on many factors such as whether there are other individuals available to help, whether the care recipient lives in the same home or another home, and the general health of the care recipient. Additionally, households that can take on paid support for respite care or certain activities can provide more flexibility for care activities than those without those resources. This significant heterogeneity may impact the caregivers in different ways and makes it important to differentiate caregivers for the ill or elderly from caregivers for minors. It also underscores the importance of measuring variability in the hours per day and days per week of caregiving.

The challenges of identifying caregiving students in universities

Given the increase in caregiving students nationally in the US (Armstrong-Carter et al., 2021), there is an urgent need for research to identify the prevalence of caregiving university students, and understand their emotional and academic experiences. Identification and assessment of outcomes is a crucial first step for educators, administrators, and policymakers in higher education to support caregiving students. However, identifying caregiving students in higher education can be challenging. With the absence of recognition of young people as caregivers in the US, children, adolescents, and young adults may not always self-identify what they do as caregiving. The term “caregiver” does not always resonate with young adults who view their care as part of being a family member, or as a category that they feel does not accurately reflect their relationships or their identities (Lewis, 2018). More research is needed to identify caregivers, and to examine how these variations in caregiving responsibilities and characteristics impact student success and wellbeing.

Student characteristics and caregiving

Existing evidence of the association between youth caregivers' racial and gendered identities and their experiences of caregiving raises both questions and concerns as they relate to diversity, equity, and inclusion goals for college students. Although the experience of caregiving is increasingly common across individual backgrounds and characteristics (Armstrong-Carter et al., 2021), young adult student caregivers are believed to be more common among historically marginalized racial, ethnic, and socioeconomic groups (AARP & National Alliance for Caregiving, 2020). There are several patterns in data about student caregivers that suggest intersectional identities matter to the scope and scale of care that they provide. First, young adult student caregivers around age 30 are more likely to be African American, Latinx, or Asian, compared to White non-Latinx (AARP & National Alliance for Caregiving, 2020). However, the demographic associations with caregiving have not yet been tested during the college years (ages 18–25 years), a critical developmental transition that sets the stage for lifelong success and achievement. Second, adult caregivers are more likely to come from households with low

socio-economic status without hired caregivers (Bruhn and Rebach, 2014). In the university years, this disparity may be reflected in anecdotal evidence of students who are first-generation or receiving financial aid being over-represented as caregivers or having to prioritize caregiving over attending class or participating in activities with peers. Third, young adult caregivers may be more likely to identify as women as evidenced in recent research from six European countries (Santini et al., 2020). It is important to extend this work to examine racial and gendered disparities in caregiving among young adult caregiving students in the US. Identifying disparities in caregiving is an important first step in supporting caregiving students in higher education and reducing inequalities.

Caregiving students and emotional wellbeing

A key goal of universities across the US is to identify students who may be experiencing hardships or emotional or academic challenges so that they do not “fall between the cracks.” Students who are caregivers and remain in higher education persist in their educational goals even with added familial responsibilities, and they may develop skills and perspectives from caregiving that improve and enhance their future success (Lewis, 2018; Shifren, 2008, 2009). However, caregiving responsibilities that require significant time, emotional investment, or finances can be stressful for college students who do not receive sufficient support (Hooper et al., 2014). Accordingly, it is important to investigate how caregiving relates to students’ emotional wellbeing, such as their symptoms of anxiety and depression.

Although caregiving can be rewarding, research from adults shows that caregiving for someone who is elderly or sick can be stressful and interfere with physical and emotional health (del-Pino-Casado et al., 2018). This finding was recently replicated in a large, representative sample of middle and high school students in Florida (Armstrong-Carter et al., 2021). In small qualitative studies of college-age samples, caregiving stresses were associated with poorer mental health and social connections outside the family (Dellmann-Jenkins et al., 2000), and heightened worry and fatigue (Mancini et al., 2006). In a quantitative study of 353 undergraduate students, caregivers reported significantly higher levels of depression and anxiety symptoms compared to non-caregivers (Greene et al., 2017). Caregiving for elderly or chronically ill individuals may be uniquely stressful (compared to caring for someone who is not elderly or ill) because of increased worries for the loved one’s physical wellbeing (Schulz and Eden, 2016). In contrast, caregiving for someone without aging-related needs, illness, or disability can be relatively less stressful when caregiving responsibilities are shared, or when structures and services, such as schooling or after-school care are both reliable and readily available. As such, the experience of providing sustained care as a university student may be differently associated with depression and anxiety depending on the characteristics of the care recipient. Distinguishing between caregiving recipients, and if caregiving is related to medical or health conditions, can therefore also help to distinguish gaps in needed supports and services, such as for non-parent caregivers or caregivers of aging adults.

Caregiving students and academic performance

Caregiving can also impact university students’ academic performance because of the difficulty of simultaneously juggling both family and academic demands (Siskowski, 2006). For example, time spent caregiving may detract time from studying, or hinder access to supportive academic services such as tutoring. Adult caregivers tend to have lower educational attainment compared to non-caregivers (Bruhn and Rebach, 2014), and middle and high

school students who are caregivers also showed lower academic GPA (Armstrong-Carter et al., 2021). Among college students in the UK, caregiving students report frequently missing class and social activities to stay at home to support their older or chronically ill family member (Becker and Sempik, 2018). Similar results were found in one small qualitative study in the US (Mancini et al., 2006). Moreover, the stresses associated with caregiving could interfere with students’ concentration, sleep, or emotional wellbeing, which in turn hinder academic success (Siskowski, 2006). Understanding the link between caregiving and academic performance during university years can help to identify whether these students face heightened academic risk and could benefit from school-based support. In particular, caregiving responsibilities could be one key mechanism through which achievement gaps emerge (Armstrong-Carter et al., 2021). In higher education, student supports have the potential to be fine-tuned to better address caregiver needs, thus improving the likelihood that student caregivers will be able to access the benefits that graduation from university provides for more general educational success and employment opportunities across the lifespan (Lövdén et al., 2020).

The current study

This study presented data from a novel university-wide survey of caregiving undergraduate and graduate students in the US, one of the first to date. The study had three primary goals. (1) The study identified the prevalence of caregiving students for elderly/ill persons and minors on a large college campus and examined the intensity of their caregiving (i.e., hours per day and days per week). The methods differentiated between caregiving students for the ill and elderly and caregivers for minors to allow for the possibility that different types of caregiving may differentially impact adjustment. Further, by examining the intensity of caregiving both as hours per day and days per week, the study shed light on whether the chronicity and duration of caregiving are impactful. (2) The study examined the demographic characteristics of caregiving students (i.e., gender, age, graduate status, first-generation status, socio-economic status (operationalized as the receipt of financial aid known as the Pell grant), and full-time vs. part-time status. (3) The study examined the association between caregiving and students’ adjustment (i.e., academic performance, anxiety, depression), controlling for student individual and family demographic characteristics. By linking survey results to verified institutional records of demographics and academic GPA, this study employs reliable measures of students’ socio-economic status and academic performance.

Methods

Participants. The data were drawn from a campus-wide survey of 7592 undergraduate and graduate students at a public university in North Carolina. North Carolina does not currently have any formal policies to support caregiving students, although caregiving social services are available to individuals over the age of 18. Of the 7592 participants who responded, 69.9% identified as women ($N=5308$), 30.0% identified as men ($N=2277$), and <0.1% were gender non-binary ($N=7$). The sample was primarily White non-Latinx (62.7%), Asian (14.5%), Latinx (8.1%), Black/African American (6.2%), and Mixed/Other Race (e.g., Native American; 8.6%). For analysis, the Mixed/other Race/ethnicity groups were combined because the sample sizes were so small. For instance, there were only 21 American Indian participants and 3 Pacific Islander participants, consistent with persistent barriers to higher education which American Indians face (Keith et al., 2016). The sample was primarily composed of undergraduate students (67.5%), compared to graduate students,

which included Ph.D. students, medical students, and other graduate degree students (32.5%). Medical students were included as graduate students because medical programs in the US require a Bachelor's degree for admission and therefore medical school is considered higher education. The majority of participants were full-time students (86.35%), compared to part-time students (13.65%). The undergraduate students were fairly evenly distributed by year in school; 30.21% were in their first year, 22.43% in the second year, 23.39% in the third year, and 21.76% in the fourth year. The graduate students were mostly either first-year students (40.91%) or second-year students (28.59%), followed by the third year (12.35%) or fourth year (7.12%). A small percentage of graduate students identified as another year, such as between years or a fifth year or higher (10.04%). A small portion of participants were first-generation students (12.6%). On average, participants' GPAs were relatively high ($M = 3.49$, $SD = 0.43$).

Socio-economic status was operationalized as financial aid (Pell grants). The Pell grant is a form of financial assistance that is offered to undergraduate students from low socio-economic status backgrounds and is assigned based on family income (Federal Pell Grant, 2021). Students who received Pell grants were categorized as from low socio-economic status backgrounds (20.6%) and non-Pell recipients were categorized as not from low socio-economic status backgrounds (79.4%). This information was only available among undergraduate students.

Procedures. Students at the large public research university in the South Eastern United States received an email invitation to participate in a campus-wide survey in the fall of 2020. It is important to note that the survey was distributed 7 months after social distancing measures related to the COVID-19 pandemic required University campus closure. The survey was designed overall to assess a variety of aspects of student well-being. The survey was designed to help university administrators understand students' experiences of managing academic goals, relationships, and family responsibilities such as caregiving. All undergraduate and graduate students were invited to participate. All participants provided informed consent online. Student responses were linked to university records to obtain records of student GPA, Pell grant receipt, first-generation status, undergraduate vs. graduate student status, and full-time vs. part-time status. The surveys included additional questions about students' course choices and experiences, which are not included in the current analysis. The surveys took approximately 10 min to complete. All procedures were approved by the University ethical review board at the University of North Carolina at Chapel Hill, and all research was performed in accordance with relevant regulations. Data and syntax are available upon request from the corresponding author.

Measures

Caregiving. Students' experiences of providing caregiving were indexed by four primary variables. Two dichotomous variables reflected whether the student self-identified as a caregiver or not, and two additional variables reflected the intensity of caregiving (i.e., hours spent caregiving per day, and days spent caregiving per week).

Caregiver for elderly/ill person: Participants were asked, "Are you a caregiver for someone who is chronically ill (lasts 3 months or more) or elderly or in need of care?" Participants responded via three response choices: "No, I do not provide care support for someone who is chronically ill, elderly, or in

need of care", "Yes, I currently live with the person(s) that need my help or support", or "Yes, I do not currently live with the person(s) that need my help or support." This was then coded as dichotomous measure (1 = the participant provided care for someone who is chronically ill, elderly, or in need of care either within or outside of their home; 0 = the participant did not provide care for someone who is chronically ill, elderly or in need of care).

Caregiver for minor: Participants were asked, "Are you a caregiver, parent, and/or guardian for a minor or dependent who is under age 18?" Participants responded via three response choices: "No, I am not a caregiver, parent, and/or guardian for a minor or dependent under", "Yes, for one person under the age of 18", or "Yes, for more than one person under the age of 18". This was then coded as a dichotomous measure (1 = the participant provided care for one minor or more, 0 = the participant did not provide care for a minor).

Hours caregiving per day: Participants were asked, "How many hours per day do you typically spend caregiving?" Participants responded by a scale ranging from zero to 24. Accordingly, this variable was continuous, with higher values indicating more hours of caregiving per day.

Days caregiving per week: Participants were asked, "How many days per week do you typically spend caregiving?" Participants responded via five response choices: "There is no one in my family or home who is chronically ill, elderly, or disabled", "0 days per week", "1 or 2 days per week", "3 to 5 days per week", or "6 or 7 days per week". The first two responses were combined, such that 0 indicated that the participant either had no one to care for or spent 0 days per week caregiving. Accordingly, this variable was categorical, such that 0 = no caregiving, 1 = caregiving 1–2 days per week, 2 = caregiving 3–5 days per week, and 3 = caregiving 6–7 days per week.

Individual and family characteristics

Gender: Participants self-identified their gender via the campus-wide survey. For analysis, gender was coded 1 = girls/young women, 0 = boys/young men.

Race/ethnicity: For analysis, race/ethnicity was coded as White non-Latinx, Asian, Latinx/Hispanic, Black/African American, and Mixed/Other Race (e.g., Native American; Pacific Islander, more than one race). Again, the Mixed/Other Race were combined into one group due to the small sample sizes of each group.

Part-time status: University institutional records indicated if the participant was either full-time (minimum 9 credit hours per semester for graduate students and minimum of 12 credit hours for undergraduate students) or part-time (fewer than 9 for graduate students and fewer than 12 for an undergraduate student). There were 1036 part-time students in the sample (13.65%).

Pell grant recipient: University records indicated if the participant was the recipient of the Pell financial aid grant or not. The Pell grant is a form of financial assistance which is offered to students from households with low socio-economic status. This was a dichotomous measure. There were 1055 Pell grant recipients in the sample (13.90%).

First generation student: University records indicated if the participant was a first-generation college student or not. This was a

dichotomous measure. There were 956 first-generation students in the sample (12.59%).

Undergraduate vs. graduate student: University records indicated if the participant was an undergraduate or graduate student. Graduate students included Ph.D. students, medical students, and professional students. This was a dichotomous measure. There were 2466 graduate students in the sample (32.48%).

Student adjustment

Depression: Participants responded to four items from the Center for Epidemiologic Studies Depression (CES-D) tool (Radloff, 1977). Participants were asked “Over the last two weeks, how often have experienced the following?”, followed by four specific items: “I felt depressed”, “I felt lonely”, “I had crying spells”, and “I felt sad”, ($\alpha = 0.87$). Participants responded to each of these items on a four-point Likert-type scale ranging from “Rarely or none of the time (less than 1 day)”, “Some or a little of the time (1–2 days)”, “Occasionally or a moderate amount of time (3–4 days)”, “Most or all of the time (5–7 days a week)”.

Anxiety: Participants responded to the Generalized Anxiety Disorder Screening tool (GAD), a measure that includes 7 items (Löwe et al., 2008). Specifically, participants were asked, “Over the last two weeks, how often have experienced the following?” The items were: “I felt nervous, anxious, or on edge”, “I was not being able to stop or control worrying”, “I worried too much about different things”, “I had trouble relaxing”, “I am so restless that it is hard to sit still”, and “I became easily annoyed or irritable” ($\alpha = 0.91$). Participants responded on a four-point Likert-type scale ranging from “Rarely or none of the time (less than 1 day)”, “Some or a little of the time (1–2 days)”, “Occasionally or a moderate amount of time (3–4 days)”, “Most or all of the time (5–7 days a week)”.

Academic performance: University records indicated the participants’ most recent GPA, which ranged from 0.5 to 4.

Statistical analysis. Research question 1 was addressed using descriptive analyses (i.e., percentages, mean, and standard deviations) to identify the prevalence of caregiving students and the intensity of their caregiving tasks. Regression models were used for the second research question, how students’ individual and family demographic characteristics (i.e., student gender, race/ethnicity, Pell grant receipt, full-time vs. part-time status, undergraduate vs. graduate status, and first-generation status) were associated with their caregiving outcomes. The specific type of regression varied by the specific caregiving outcome measure. Logistic regressions were used to predict the likelihood of caregiving for an elderly/ill person and the likelihood of caregiving for a minor because the outcomes were binary. Negative binomial regressions (which adjust for over-dispersed count outcome variables) were used to predict caregiving hours per day and caregiving days per week, (Hilbe, 2011). This approach was optimal because the majority of participants in the sample were not caregivers, so the data was heavily weighted towards zero.

Regression models also were used for the third research question, how students’ experiences of caregiving (i.e., caregiving hours per day, and caregiving days per week) were associated with their adjustment (i.e., depression, anxiety, and academic performance). These models used standardized linear regressions because the outcomes were continuous and normally distributed. The associations between caregiving intensity and student adjustment were first tested in the full sample, then separately among caregivers for elderly/ill persons, and caregivers for minors. All regression models controlled for participants’ gender, race/ethnicity, Pell grant receipt, full-time vs. part-time status, undergraduate vs. graduate status, and first-generation status. Men and White non-Latinx youth served as the reference groups.

Table 1 Sample demographic statistics and levels of caregiving for the full sample and by caregiver type.

	N				%			
Full sample	7592				100			
Women	5308				69.9			
Men	2277				30.0			
White non-Latinx	4757				62.7			
Asian	1100				14.5			
Latinx	617				8.1			
Black/African American	468				6.2			
Mixed/Other Race/Ethnicity	650				8.6			
First generation students	956				12.59			
Graduate students	2466				32.5			
Students from low socioeconomic status	1055				13.90			
Part-time students	1036				13.65			
	Full sample				Caregiver for elderly/ill person		Caregivers for minor	
	Min	Max	M	SD	M	SD	M	SD
GPA	0.5	4	3.49	0.43	3.38	0.47	3.09	0.79
Anxiety	1	4	2.56	0.87	2.63	0.90	2.36	0.92
Depression	1	4	2.21	0.91	2.22	0.99	1.82	0.86
Days Caregiving per Week	1	4	1.06	0.37	2.63	1.13	1.51	1.04
Hours Caregiving per Day	0	24	0.34	2.01	4.89	5.47	7.53	6.72
Observations	7592				239		227	

In addition, <0.1% of the sample identified as gender non-binary ($N = 7$), none of whom identified as caregivers. Low socioeconomic status was defined as receiving need-based financial aid (i.e., the Pell Grant).

Missing data was low (<1%) for all variables except depression (missing 28.20%), anxiety (missing 28.46%), and GPA (missing 52.05%). GPA data was largely missing due to first-year student participants who had not received grades from the university and thus did not have a GPA available for analysis (61.08% of participants who were missing GPA data were first-year students). Missing data were handled using listwise deletion. Analyses were conducted using Stata software (StataSE, Version 17, StataCorp., College Station, TX, USA).

Results

Descriptive information about the prevalence of caregiving students. The first research aim was to identify the prevalence of caregiving students and the intensity of their caregiving responsibilities. In the full sample, 5.7% ($N = 427$) of students reported that they provided at least some care for another person. Specifically, 3.2% ($N = 239$) of participants cared for a person who was chronically ill or elderly. Of these students who cared for someone who was ill or elderly, the majority cared for a parent or step-parent ($N = 102$), whereas others cared for a grandparent ($N = 64$), another relative ($N = 26$), a sibling ($N = 25$), a spouse or partner ($N = 15$), or someone else ($N = 7$). In addition, 3.0% ($N = 227$) of participants provided care for a minor under age 18. Of these students who cared for a minor, 1.4% of participants ($N = 108$) provided care for one minor, whereas 1.6% of participants ($N = 119$) provided care for more than one minor. Only a few students were caregivers for both a minor and someone who was chronically ill or elderly (0.5%; $N = 39$).

Descriptive information about caregiving hours per day and days per week. Table 1 provides descriptive information about study variables for the full sample, for caregivers for an elderly or ill family member, and for caregivers for a minor. Among caregivers for an elderly or ill family member, it was most common for caregiving students to provide care 6–7 days per week (31.38%, $N = 75$), followed by 3–5 days per week (27.62%, $N = 66$), 1–2 days per week (20.50%, $N = 49$), and <1 day per week (20.50%, $N = 49$). On average, students who cared for an elderly or ill family member provided <4.89 h of care per day ($M = 4.89$ h, $SD = 5.47$ h), although there was a wide range of caregiving hours per day (range = 0–24 h). Among caregivers for a minor, it was most common for caregiving students to provide care less than 1 day per week (78.0%, $N = 177$), followed by 6–7 days per week (12.8%, $N = 29$), 1–2 days per week (5.73%, $N = 13$), and 3–5 days per week (3.5%, $N = 8$). On average, students who cared for a minor provided <7.53 h of care per day ($M = 7.53$ h, $SD = 6.72$ h), although there was a wide range of caregiving hours per day (range = 0–24 h). Table 2 displays bivariate correlations between study variables.

Demographic characteristics and caregiving. The second research aim was to understand the demographic characteristics

of caregiving students. Table 3 displays result from regression models in which demographic characteristics predict the likelihood of caregiving (Models 1 and 2) and intensity of caregiving (Models 3 and 4). As shown in Model 1, on average, students who provided any caregiving for an elderly/ill person were 1.75 times more likely to be women, 1.66 times more likely to be part-time students, 2.08 times more likely to receive need-based financial aid, and 1.42 times more likely to be graduate students. Similarly, as shown in Model 2, on average, students who provided any caregiving for a minor were also 1.83 times more likely to be part-time students, 1.05 times more likely to receive need-based financial aid, and 10.49 times more likely to be graduate students. They were also 41% less likely to be Asian compared to White. There were no other significant associations between demographic characteristics and the likelihood of caregiving for any type of care recipient ($p > 0.05$).

In addition, as shown in Table 3, demographic characteristics were also associated with the intensity of caregiving as indexed by caregiving hours per day (Model 3). Specifically, as shown in Model 3, on average, graduate students spent more hours caregiving per day ($B = 1.52$, $SE = 0.21$, $p < 0.001$), as did part-time students ($B = 0.54$, $SE = 0.27$, $p < 0.05$), and Pell grant recipients ($B = 1.05$, $SE = 0.32$, $p < 0.01$). However, as shown in Model 4, demographic characteristics were not associated significantly with caregiving days per week ($p > 0.05$).

Students’ experiences caregiving and their depression, anxiety, and academic performance. The third research aim was to understand how caregiving as a student was associated with depression, anxiety, and academic performance (GPA). Table 4 displays result from regression models in which caregiving intensity predicts students’ depression, anxiety, and academic performance. These regression models control for gender, race/ethnicity, Pell grant receipt, full-time vs. part-time status, undergraduate versus graduate student, and first-generation status. However, for simplicity, these covariates are omitted from Table 4. As shown in Panel 1, on average in the full sample, students who spent 3–5 days caregiving exhibited lower academic performance ($B = -0.63$, $SE = 0.20$, $p < 0.01$). Similarly, as shown in Panel 2, among caregiving students for elderly/ill persons, those who spent 3–5 days caregiving exhibited lower academic performance ($B = -0.71$, $SE = 0.24$, $p < 0.05$). In addition, caregiving students for elderly/ill persons who spent more hours caregiving per day experienced higher levels of depression ($B = 0.07$, $SE = 0.03$, $p < 0.05$) and anxiety ($B = 0.07$, $SE = 0.03$, $p < 0.01$). As shown in Panel 3, caregiving for a minor was not associated significantly with depression, anxiety, or academic performance ($p > 0.05$).

Discussion

The goal of this study was to understand the prevalence of caregiving students in higher education institutions in the US, and

Table 2 Bivariate correlations between study constructs.						
	1	2	3	4	5	6
1 Caregiver for Elderly/ill person (binary)	1					
2 Caregiver for Minor (binary)	0.14***	1				
3 Days Caregiving per Week	0.80***	0.22***	1			
4 Hours Caregiving per Day	0.41***	0.62***	0.43***	1		
5 GPA	−0.05**	−0.10***	−0.07***	−0.05**	1	
6 Anxiety	0.02	−0.05***	0.02	0.00	−0.10***	1
7 Depression	0.00	−0.09***	−0.00	−0.03*	−0.07***	0.72***
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.						

Table 3 Demographic characteristics predicting the likelihood of caregiving and intensity of caregiving.

	Model 1		Model 2		Model 3		Model 4	
	Caregiver for elderly/ ill person		Caregiver for minor		Caregiving hours per day		Caregiving days per week	
	Odds ratio	SE	Odds ratio	SE	B	SE	B	SE
Black	0.93	(0.25)	1.46	(0.35)	−0.17	(0.39)	0.02	(0.05)
Asian	0.80	(0.17)	0.59*	(0.15)	−0.28	(0.26)	−0.00	(0.03)
Latinx	0.76	(0.20)	0.88	(0.24)	−0.01	(0.36)	−0.01	(0.04)
Mixed/other	1.04	(0.24)	1.22	(0.30)	0.12	(0.33)	0.00	(0.04)
Women	1.75***	(0.29)	0.91	(0.14)	0.33	(0.20)	0.01	(0.02)
Graduate student	1.42*	(0.23)	10.49***	(2.33)	1.52***	(0.21)	0.01	(0.03)
Part-time student	1.66**	(0.29)	1.83***	(0.28)	0.54*	(0.27)	0.04	(0.03)
Need-based financial aid	2.08***	(0.41)	3.88***	(1.17)	1.05**	(0.32)	0.04	(0.04)
First generation student	0.92	(0.20)	1.05	(0.30)	−0.19	(0.33)	−0.00	(0.04)
Constant	0.02***	(0.00)	0.01***	(0.00)	−2.26***	(0.22)	0.03	(0.02)
Observations	7585		7585		7585		7585	

Standard errors in parentheses. Models for the first two outcomes use logistic regressions for dichotomous outcomes. Models for the second two outcomes use negative binomial regressions for count outcomes adjusting for weight towards zero.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

how caregiving as a student is associated with academic achievement and emotional wellbeing. The study revealed that a substantial proportion of students were involved in caregiving for someone who was elderly, ill, and a minor on a daily and weekly basis, and caregivers of all types were more likely to be graduate students, part-time students, and of lower socio-economic status than their non-caregiving peers. Further, students who were caregivers for someone who was elderly/ill (but not for a minor) showed lower academic performance and higher levels of anxiety and depression compared to their non-caregiving peers. These findings highlight the urgent need for US universities to identify and support the needs of caregiving students.

Demographics of caregivers. In this study, a small but substantial proportion of students were involved in caregiving. Almost 6% of students identified as caregivers for a person who was chronically ill or elderly, and 3% identified as caregivers for a minor under age 18. These percentages may seem small, but in this large sample, they corresponded to more than 400 students combined. Caregivers for a chronically ill or elderly person provided care on *more days* per week (on average 6–7 days) compared to caregivers for minors (on average 1 day). However, caregivers for minors provided care *more hours per day* compared to caregivers for chronically ill or elderly persons. These findings illustrated that caregiving is a not-uncommon experience among university students, and can require significant amounts of time. Further, these findings demonstrated the feasibility of identifying caregiving students via large-scale, university-wide surveys in the US.

Identifying individual and family characteristics of caregiving students can reveal which students are juggling multiple home- and school-based responsibilities, and may benefit from institutional supports. Caregivers of elderly/ill or minors were more likely to be graduate students, part-time, and from families of low-socioeconomic status. Graduate students may be more likely to provide care because they are older, have elder relatives (e.g., grandparents, parents), and potentially have children who require support (Yoo, 2021). In addition, caregiving requires significant amounts of time, so part-time enrollment may be more feasible for caregiving students for juggling both academic and caregiving responsibilities (Levine et al., 2005). Students from households with low socio-economic status may also be more likely to

provide care because their families cannot afford in-home or out-of-home assistance (Bruhn and Rebach, 2014).

In addition, young women were more likely to care for someone who was elderly or ill, although young women and men were equally likely to care for minors. This finding was consistent with prior evidence from Europe that young adult caregivers for older adults and individuals with chronic illness were more likely to be women, due to historical inequities in the labor market and gendered social expectations (Santini et al., 2020). In contrast, gender disparities may not have been as apparent among caregivers for minors because they were fathers or mothers, or paid babysitters.

Caregiving emerged broadly as a common experience across racial and ethnic groups. This finding was consistent with evidence that caregiving is an increasingly common characteristic across groups (AARP & National Alliance for Caregiving, 2020), but diverges from some evidence that caregivers are over-represented among adults from historically marginalized racial and ethnic groups (AARP & National Alliance for Caregiving, 2020). Only one racial/ethnic group difference emerged in this study, such that caregivers of minors were more likely to be White non-Latinx compared to Asian. This could be because Asian or Pacific Islander mothers on average give birth to their first child at an older age compared to other racial and ethnic groups in the US (Matthews and Hamilton, 2016). College-age Asian students tend to have no children or fewer children compared to other racial and ethnic groups (Matthews and Hamilton, 2016).

Caregivers for the elderly and ill are associated with emotional and academic risk. Students' experiences of caregiving were associated divergently with their academic and emotional adjustment depending on whether they were caregiving for a minor or a person who was elderly or chronically ill. Specifically, caregiving for a minor was not related to depression, anxiety, or academic performance (i.e., GPA). However, caregivers for a person who was elderly or ill experienced higher levels of depression and anxiety, and lower academic performance compared to their non-caregiving peers. This finding persisted when controlling for individual differences in students' gender, race/ethnicity, part-time vs. full-time status, graduate status, and socio-economic status. These findings suggested that caregivers for

Table 4 Associations between caregiving and emotional and academic adjustment.

Panel 1						
Full sample						
	Depression		Anxiety		Academic performance	
	B	SE	B	SE	B	SE
Caregiving 1–2 days/week	0.11	(0.12)	0.07	(0.12)	–0.16	(0.18)
Caregiving 3–5 days/week	0.08	(0.14)	–0.07	(0.14)	–0.63**	(0.20)
Caregiving 6–7 days/week	–0.07	(0.11)	0.14	(0.11)	–0.18	(0.16)
Hours caregiving/day	–0.00	(0.01)	0.01	(0.01)	–0.02	(0.02)
Constant	–0.17***	(0.03)	–0.16***	(0.03)	0.12***	(0.03)
Observations	5426		5446		3640	
R-squared	0.07		0.05		0.11	
Panel 2						
Caregivers for elderly/ill persons						
	Depression		Anxiety		Academic performance	
	β	SE	β	SE	β	SE
Caregiving 1–2 days/week	0.15	(0.20)	0.08	(0.20)	–0.34	(0.31)
Caregiving 3–5 days/week	0.14	(0.22)	–0.06	(0.21)	–0.71*	(0.34)
Caregiving 6–7 days/week	0.03	(0.21)	0.20	(0.20)	–0.40	(0.30)
Hours caregiving/day	0.07*	(0.03)	0.07**	(0.03)	0.05	(0.04)
Constant	–0.38	(0.24)	–0.29	(0.23)	0.47	(0.33)
Observations	238		239		111	
R-squared	0.10		0.09		0.23	
Panel 3						
Caregivers for minors						
	Depression		Anxiety		Academic performance	
	β	SE	β	SE	β	SE
Caregiving 1–2 days/week	0.30	(0.26)	0.23	(0.30)	–2.14	(1.86)
Caregiving 3–5 days/week	–0.40	(0.34)	–0.20	(0.39)	–0.75	(0.79)
Caregiving 6–7 days/week	–0.02	(0.19)	0.20	(0.21)	0.56	(0.61)
Hours caregiving/day	0.02	(0.02)	0.03	(0.02)	–0.05	(0.08)
Constant	–0.73**	(0.23)	–0.78**	(0.27)	0.73	(0.96)
Observations	223		224		40	
R-squared	0.18		0.12		0.56	

Standard errors in parentheses. Models additionally control for race/ethnicity, gender, need-based financial aid, full-time vs. part-time status, undergraduate vs. graduate student, and first-generation status.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

older and ill persons face a unique risk for academic and emotional challenges.

Caregiving for individuals who are elderly or chronically ill may be a particularly taxing experience compared to caregiving for minors for several reasons. First, caregiving for the elderly/ill involves a physical or mental health condition which may be inherently more stressful than caring for a typically-developing minor. The stresses associated with caregiving may contribute to symptoms of anxiety and depression, as caregivers struggle to receive emotional support for their work, worry about their loved ones, and find it difficult to meet their own needs while they are caregiving. In contrast, caregiving for a minor may include parenthood for typically developing children, or experiences of paid babysitting, which on average are likely less stressful by comparison. Future research should build on this study by distinguishing between parenting a minor or babysitting for another person's child, to clarify the type of care provided to the minor(s).

Second, caregivers for older and ill persons may experience poor emotional well-being and academic performance in part

because they are less able to spend time socially with peers socially and dedicate time to maintaining their own emotional health. In turn, this could contribute to heightened feelings of isolation, sadness, or anxiety among caregivers for older and ill persons. In contrast, caregivers for minors may be able to socialize while looking after the child. Further, the time spent caregiving for an elderly or ill person and the stresses of caregiving for aging- and health-related problems can detract from time spent studying, completing homework, and participating in supportive academic activities such as tutoring or study groups (Levine et al., 2005; Siskowski, 2006). Lack of access to these enrichment opportunities detracts from academic engagement and performance over time (Levine et al., 2005; Siskowski, 2006).

The findings from this study were consistent with research from the US in qualitative studies and small quantitative samples. Two qualitative studies of university students found that caregiving was associated with heightened worry, fatigue, poorer mental health, and fewer social connections outside the family (Dellmann-Jenkins et al., 2000; Mancini et al., 2006). Similarly,

one quantitative study of 353 undergraduates found that caregiving was associated with greater symptoms of depression and anxiety (Greene et al., 2017). Further, caregiving students reported frequently missing class and social activities to stay at home to support their older or chronically ill family member (Mancini et al., 2006). Similar empirical evidence was found in the UK (Becker and Sempik, 2018). However, the current results diverge from one study in Europe, which found that male caregivers of grandparents experienced better emotional health than other caregivers (e.g., caregivers for children), though this was not the case for women (Santini et al., 2020). In the US context, the current study suggests that caregiving while a university student for elderly or ill relatives may be particularly challenging. Further qualitative research can illuminate which specific daily experiences and emotional processes contribute to adjustment difficulties among US student caregivers for elderly and chronically ill family members.

It is important to interpret the study findings in the context of the COVID-19 pandemic given the timing of this study. Comparison with non-pandemic conditions will clarify how these trends continue into the future. There may be underreporting by caregivers, due to time pressures of caregiving, perhaps especially during the pandemic. In addition, heightened distress experienced during the pandemic, compared to non-pandemic times, may have impacted the results (Czeisler et al., 2020). In June 2020, the CDC found that pandemic-era mental health challenges were highest amongst young adults (age 18–24 years) and unpaid caregivers for adults (Czeisler et al., 2020). Future research may also reveal more increases in students' caregiving responsibilities over time, particularly if the long-term impacts of COVID-19 impose greater pressures upon family caregiving. For example, the pandemic may create more long-term caregivers amongst university students because of the increase in chronic health conditions across the population. The pandemic could also intensify the demand for family caregiving if it continues to create larger demands upon an already strained respite and domestic care workforce.

Conclusions

Higher education opens up many opportunities for different careers, higher incomes, and young adult's personal development and growth. Identifying populations of students who face a disproportionate risk for emotional health challenges and low academic performance is crucial for informing interventions to reduce disparities. This robust, large, study revealed that caregiving students are disproportionately from backgrounds of low socio-economic status, graduate student careers, and part-time status in the US. Further, caregiving students for an older or ill relative face heightened risk for interferences with academic performance and emotional health. If universities aim to increase access to education across broad characteristics of students, they must count on and provide services for caregiving students. Given the institutional structures in place for tabulating and identifying students who could benefit from services, the addition of a measure of caregiving students to university-wide surveys would be a small first step. Indeed, this study has demonstrated that identifying caregiving students via a school-wide survey is feasible. Moreover, identifying caregiving students is critical for supporting their emotional health and educational success. Specifically, identifying and supporting caregiving students may help to reduce persistent disparities in educational opportunities and achievement along gender and socioeconomic lines.

Limitations and future directions. This study has several limitations and points to areas for future research. First, this study is correlational and cross-sectional. Future quasi-experimental

research may help to clarify the causal impact of caregiving, for example via a regression discontinuity design that assesses outcomes before and after caregiving begins or intensifies. Second, although the primary statistical models included thousands of diverse students, one of the regression models had a very small sample size, due to the small prevalence of caregivers for minors and high levels of missing GPA data. This small sample size likely reduced statistical power and the possibility of detecting significant associations between caregiving for minors and academic performance. Future research should replicate these analyses in larger samples of caregivers for minors.

Third, although this sample reflected the demographic makeup of the region, future research should replicate these findings across other college campuses with more diverse samples, because additional differences by race or ethnicity may emerge. In more diverse samples, it will also be important to examine individual characteristics that moderate the link between caregiving as a student and adjustment. For example, caregiving for an elderly or ill person may be related to anxiety and depression particularly strongly in lower-income households where fewer material resources are available, compared to higher-income households. To address these questions and others, future research may benefit from using alternative methodological approaches such as interaction models or latent-profile analyses to understand the experiences of specific subpopulations of caregiving students.

Future longitudinal research in the US should also identify whether caregiving is associated with increased risk for early departure from school, for example, via exit interviews or administrative records. In the UK for example, young adult caregivers were four times more likely than their non-caregiving peers to leave higher education before graduation (Kettell, 2020). Finally, this study focused on the unique population of caregiving young adults who are also students, but many other young adults who are not enrolled in university are also caregivers. Future research should investigate disparities in caregiving and the impacts of caregiving among other samples of young adults, for instance, those who are employed, in training, unemployed, or attending community colleges. For instance, students who find their transitions to adulthood severely disrupted by the COVID-19 pandemic may not have the opportunity to pursue education at a large research university. There is also a need to further investigate how young peoples' provision of care relates to their emotional adjustment and educational experiences in low-and-middle-income settings such as Vietnam (Le et al., 2021) and South Africa (Cluver et al., 2012). As other leaders in this field have highlighted, caregiving young people across the world should be recognized, identified, and supported as a distinct group who may benefit from additional institutional support (Becker, 2007).

Data availability

Data and syntax are available upon request from the corresponding author.

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Competing interests

The authors declare no competing interests.

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All procedures were approved by the University ethical review board at the University of North Carolina at Chapel Hill, and all research was performed in accordance with relevant regulations.

Informed consent

All participants provided informed consent online.

Additional information

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